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EDIC/ID-9
ATTACHMENT

STRATEGIC SIGNIFICANCE OF INDIUM TO THE SOVIET BLOC

I. Conclusions

There seems no indication that the Soviet bloc presently has any strategic use for indium which cannot be met from indigenous production. There is, however, a possibility that the Bloc as well as the West is conducting transistor research which might, if successful, require significant quantities of indium.

II. Definition and Description

Indium is a highly plastic metal which deforms under compression almost indefinitely. It does not "work harden" and actually softens during rolling because the recrystallization point is below room temperature. The metal and most of its alloys resist alkali corrosion and will adhere to smooth surfaces, including glass. No minerals rich in indium have been found. Some zinc blends and complex ores of lead-tin-antimony sulfides have been found to contain up to one percent of the metal.

III. Strategic Significance

The use of indium in combination with other substances as a diffused plating for bearings in reciprocating engines lessens the chance of breakdown, improves the operation, and increases the life of the bearing to a significant extent, as compared with any other known process which does not involve an increase in the size of the bearing.

The ability of indium to adhere to smooth surfaces makes it a useful component in solders for attaching glass to glass, ceramics or metal. It is a good sealer because of its resistance to oxidation. Various of these qualities make it an important ingredient of electronic items. Small quantities of indium foil are used in atomic energy research, however, the Atomic Energy Commission has no current interest in establishing an embargo on indium.

The Soviet bloc is not known to use indium in any of these ways.

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IV. Soviet bloc Production

The zinc ore in East Germany is known to contain some indium whereas that of Poland is believed not to contain any. However, there is a report that some Soviet manganese ore may contain some of it. If indium were recovered from the zinc ore of the Soviet bloc at about the same rate as is considered the maximum practicable in the United States, the total bloc output would be about 3-4 tons a year. The actual production is probably much less than this. There seems to be no question, however, but that the Soviet bloc knows how to produce the item and does extract it at least on a laboratory basis.

V. Procurement

Between August 1953 and September 1954 there have been several reports of Soviet bloc attempts to procure indium from the West. Inasmuch as these usually were to obtain small amounts, it is not known whether any of them were successful. One report of an attempt to obtain larger quantities cannot be confirmed and may very well be inaccurate.

VI. Use Patterns

Indium has a wide variety of use in the United States and may very well have a similarly wide range of application in the Soviet bloc. In most instances, however, there are reasonably satisfactory substitutes or the use is not strategic in nature, or both.

The strategic atomic energy uses would probably require only a few ounces in any one year.

Any current use in transistors, also, would be very small even compared with the very limited total output of indium. However, there is reported to be some United States and Soviet bloc research and development underway in the field of transistors which, if successful, is expected to require significant quantities of indium.

The Soviet bloc is believed not to be using indium on the bearings of aircraft or other similar reciprocating engines such as those used in armored vehicles and the total of such use in the United States is believed to be in the neighborhood of one ton. Any use of a zinc-indium alloy for coating hollow steel propeller blades would be as a substitute for chromium. Since chromium is not in short supply in the bloc, this practice seems unlikely. There seems to be no significant use for indium in jet engines or other parts of jet aircraft.

A report that indium is used in the USSR in armored safety vests and for sealing of detonators in shells cannot be substantiated and is considered unlikely.

V. Shortages

There is no conclusive evidence of shortage of indium in the Soviet bloc. There is, however, some possibility of a shortage if new strategic uses for the material should be developed or if the Soviet bloc should desire to embark on an extensive use of indium as a bearing coating.

VI. Gaps in Intelligence

Very little positive information on the availability and uses of indium in the Soviet bloc is available. Nevertheless, what is available fits together well enough to make the above stated conclusions reasonably reliable.